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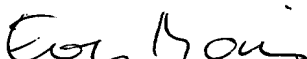
(71) Sökande Teracom AB, Stockholm SE
Applicant (s)

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PATENT- OCH
REGISTRERINGSVERKET
SWEDEN

Postadress/Adress Box 5055
S-102 42 STOCKHOLM
Telefon/Phone +46 8 782 25 00
Vx 08-782 25 00

Telex 17978
PATOREG S

Telefax +46 8 666 02 86
08-666 02 86

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Huvudfaxen Kassan

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Method for transferring information

FIELD OF THE INVENTION

5 The present invention relates generally to a method of
information transfer, for example an electronic map,
multimedia applications or the like, with one or more
radiofrequency receivers such as mobile, portable, and
stationary radiofrequency receivers, especially to a single
10 predetermined digital video broadcasting (DVB) receiver.

BACKGROUND TO THE INVENTION

There exists a number of different methods of transferring
information from an information/content provider to an
information consumer, i.e. to the destination where the
15 information/content is intended to be used. In order to
transfer information to an information consumer there must
be some means for localizing the information consumer,
which in some circumstances can be a problem. If the
information consumer is stationary then the problem might
20 arise the first time an information transfer is to take
place. On the other hand if the information consumer is
mobile, then, depending on the method of transfer, the
information consumer might have to be localized anew for
each information transfer that is to take place. Another
25 problem is how to transfer the information in an effective
manner, both from an economic as well as from a time point
of view, the information is perhaps no good tomorrow and it
must be affordable to get it.

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A mobile telephone system is an information transfer system. Voice information in the form of analog or digital information and also possibly pure digital data. A mobile telephone system addresses the previously mentioned problems in a manner intended to be efficient mainly for speech. A mobile telephone system, GSM (Global System for Mobile communication) for example, is a two-way communications system that uses cells in which transfer of information between a mobile telephone and a base station occur. As long as a mobile telephone is powered up (and even when on-hook) an intermittent exchange of information between the mobile phone and the base station of a cell in question takes place. The information exchange that takes place when the mobile phone is on-hook is, among other things, used for keeping track of the mobile phone. The base station in question passes this information on to a central database that the mobile telephone operator maintains to keep track of where all the mobile telephones are located, i.e. in what cell or group of cells they are for the moment. When a request to establish contact with a mobile phone is made then an inquiry to the central database is made to find out in which cell the mobile phone is located so that the call can be directed to the appropriate base station for a subsequent correct radio communication setup. Unfortunately a mobile telephone system has a relatively narrow bandwidth, i.e. the information transfer rate capacity is fairly low as its main purpose is to bidirectionally transfer speech which does not require a very high transfer rate.

A DVB (Digital Video Broadcasting) system, i.e. a broadcasting system, can have a similar cell structure as a mobile telephone system has, but DVB is a one-way broadcasting system, i.e. there is no way a DVB receiver can communicate with a DVB transmitter within the DVB system. The local DVB transmitter does not know which DVB

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receivers are tuned in or which DVB receivers can receive the transmitter or if any DVB receiver at all can or is receiving for that matter. A desire to transfer information to a specific DVB receiver and ensure that the DVB receiver has a theoretical chance of receiving the information would therefore involve transmitting this information across all cells that the DVB receiver might be located in, which usually means the whole DVB network and also over all the different frequencies used in the DVB network. This will result in an extremely poor usage efficiency of a DVB network even though a DVB system has a relatively large bandwidth, i.e. the information transfer rate capacity is very large to be able to serve its main purpose of broadcasting television to a large number of recipients. Unfortunately it could be argued that the described method does not use the DVB broadcasting system in a very effective manner since system bandwidth in the whole DVB network is used for the purpose of an information transfer of information which only has a value in a very limited area to perhaps a very limited number of receivers.

There seems to be no manner in which to transfer information in a DVB system to a predetermined single DVB receiver without having to download the whole system with the information, and especially not how to transfer this information in a secure manner.

SUMMARY OF THE INVENTION

An object of the invention is to define a method for providing an efficient manner of transferring information via a digital video broadcasting system to one or more predetermined information consumers.

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Another object of the invention is to define a method which is able to transfer information in a digital video broadcasting system in a safe, error tolerant and efficient manner without using more bandwidth than necessary of the digital video broadcasting system.

The above-mentioned objects are achieved in accordance with the invention by a method for transferring information from an information provider to an information consumer in a highly efficient manner by means of a digital video broadcasting (DVB) system and a secondary bidirectional transfer network. The secondary bidirectional transfer network provides information of where the DVB receiver of the information consumer is located so that only suitable DVB transmitters in the area are used for the information transfer itself. The location is determined by having at least a network identification of the transmission stream that the receiver can receive transferred via the secondary bidirectional transfer network for identification of the transmitter used. Thereby only the minimum number of necessary DVB transmitters needs to be used for the information transfer, thus relieving the rest of the DVB transmitters from an unnecessary downloading.

The aforementioned objects are also achieved according to the invention by a method for transferring information from an information provider to a predetermined information consumer. The information is transferred by means of a digital video broadcasting system to a digital video broadcasting receiver of the predetermined information consumer. To enable an efficient information transfer when a demand to transfer information to the predetermined information consumer is originated by the information provider the information transfer is supported by a secondary bidirectional transfer network such as NMT (Nordic Mobile Telephone), GSM (Global System for Mobile

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communication), PSTN (Public Switched Telephone Network),
Internet, or the like. The method comprises a number of
steps. First the information provider establishes contact
with an information transfer point for requesting transfer
5 of information to the predetermined information consumer.
The information transfer point can be part of the
information provider, part of the DVB system, or a separate
service. Thereafter the information transfer point
retrieves access information of the predetermined
10 information consumer based on the request from the
information provider. As a third step the information
transfer point establishes an initial contact with the
predetermined information consumer based on the retrieved
access information about the predetermined information
15 consumer. Thereafter the predetermined information
consumer provides the information transfer point, via the
secondary bidirectional transfer network, with transfer
configuration information comprising, in dependence on the
specific DVB network, at least one of the transport stream
20 identification, the network identification, the original
network identification, and/or the transmitter frequency
which identifies the transmitter and transport stream that
the digital video broadcasting receiver of the
predetermined information consumer receives or can receive.
25 Finally the information provider via the information
transfer point, based on the transfer configuration
information, transfers information over the digital video
broadcasting system to the digital video broadcasting
receiver of the predetermined information consumer to
30 thereby transfer information from the information provider
to the predetermined information consumer in an efficient
way.

Suitably the method advantageously also, based on the
transfer configuration information, has the information
35 transfer point transfer the information to the digital

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video broadcasting receiver of the predetermined information consumer over a selected transmitter or transmitters in the digital video broadcasting system.

5 The access information of the predetermined information consumer preferably provides information of how contact can be made with the predetermined information consumer via the secondary bidirectional transfer network and that the step of establishing an initial contact with the predetermined information consumer is done via the secondary
10 bidirectional transfer network based on the access information of the predetermined information consumer. If the step of establishing initial contact with the predetermined information consumer via the secondary bidirectional transfer network cannot be concluded then
15 preferably a broadcast over the digital video broadcasting system is performed to alert the predetermined information consumer to establish contact with the information transfer point. If the information transfer point after a timeout has not been able to establish contact with the
20 predetermined information consumer then preferably the information provider is notified that the predetermined information consumer cannot be positively contacted.

25 The access information of the predetermined information consumer can alternatively advantageously either provide no information on how contact can be made with the predetermined information consumer via the secondary bidirectional transfer network or provide information of how the predetermined information consumer is to be contacted by means of broadcasting over the digital video
30 broadcasting system to thereby alert the predetermined information consumer to establish contact with the information transfer point and that the step of establishing an initial contact with the predetermined information consumer is done via a broadcast over the

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digital video broadcasting system to thereby alert the predetermined information consumer to establish contact with the information transfer point. If the information transfer point after a timeout has not been able to

5 establish contact with the predetermined information consumer then preferably the information provider is notified that the predetermined information consumer cannot be positively contacted.

10 The transfer configuration information can further advantageously also comprise at least one of either the transport stream identification, the network identification, the original network identification, and/or the transmitter frequency which identifies the transmitter and transport stream of all transmitters receivable by the
15 digital video broadcasting receiver of the predetermined information consumer, the field strengths of all receivable transmitters, what program/transport stream if any the digital video broadcasting transmitter of the predetermined information consumer is currently receiving, or alternative
20 information transfer routes. The information transfer point can, based on the transfer configuration information, in some embodiments of the invention determine when and with what transport stream the information transfer is to take place and by means of the secondary bidirectional transfer network notify the predetermined information
25 consumer of when and with what transport stream the information transfer is to take place. In some other embodiments the decision for what, if any, alternative transport stream the information transfer should use can
30 suitably be made by the information consumer or the digital video broadcasting receiver of the information consumer.

In some versions/embodiments of the invention increased security of the information that is to be transferred is of increased concern and these comprise further steps. In a

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first additional step the information transfer point transfers a crypto key to the predetermined information consumer by means of the secondary bidirectional transfer network before, during or after transferring information over the digital video broadcasting system. The information to be transferred is encoded either by the information provider or by the information transfer point. Decoding of the transferred information is performed by means of the transferred crypto key either in the digital video broadcasting receiver of the predetermined information consumer or by the predetermined information consumer. When a high reliability of the transfer of the information is necessary the method according to the invention further comprises the following steps. First transferring checksums or the like, of the information that has or will be transferred via the digital video broadcasting system, via the secondary bidirectional transfer network to the predetermined information consumer. Secondly checking the transferred information if it is uncorrupted based on the transferred checksums or the like. Checking is performed in the digital video broadcasting receiver of the predetermined information consumer or by the predetermined information consumer. Thirdly the digital video broadcasting receiver of the predetermined information consumer or the predetermined information consumer makes a request to the information transfer point of a resending of corrupted transferred information. The request is made via the secondary bidirectional transfer network.

The aforementioned objects are also achieved by a method for transferring information from an information provider to an information consumer by means of a digital video broadcasting system to a digital video broadcasting receiver of the information consumer. The transfer is executed with support of a secondary bidirectional transfer

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network to thereby enable an efficient information transfer when a demand to transfer information to the information consumer is originated by the information consumer. The method comprises a number of steps. First of all the information consumer establishes an initial contact with an information transfer point via the secondary bidirectional transfer network with a request for an information transfer from the information provider to the information consumer. The information transfer point can be part of the information provider, part of the DVB system, or a separate service. Then the information consumer provides the information transfer point, via the secondary bidirectional transfer network, with transfer configuration information comprising, in dependence on the specific DVB network, at least one of the transport stream identification, the network identification, the original network identification, and/or the transmitter frequency which identifies the transmitter and transport stream that the digital video broadcasting receiver of the predetermined information consumer receives or can receive. The information transfer point retrieves the requested information. Thereafter the information provider via the information transfer point, based on the transfer configuration information, transfers information over the digital video broadcasting system to the digital video broadcasting receiver of the information consumer to thereby transfer information from the information provider to the information consumer in an efficient manner.

The method advantageously also, based on the transfer configuration information, has the information transfer point transfer the information to the digital video broadcasting receiver of the information consumer over a selected transmitter or transmitters in the digital video broadcasting system. The transfer configuration information can further advantageously also comprise at

least one of either the transport stream identification, the network identification, the original network identification, and/or the transmitter frequency which identifies the transmitter and transport stream of all transmitters receivable by the digital video broadcasting receiver of the predetermined information consumer, the field strengths of all receivable transmitters, what program/transport stream if any the digital video broadcasting transmitter of the predetermined information consumer is currently receiving, or alternative information transfer routes. The information transfer point based on the transfer configuration information can in some embodiments of the invention determine when and with what channel the information transfer is to take place and by means of the secondary bidirectional transfer network notify the information consumer of when and with what channel the information transfer is to take place.

The information transfer point can preferably confirm the availability or non-availability of the requested information to the information consumer via the secondary bidirectional transfer network or via the digital video broadcasting system.

In some versions/embodiments of the invention increased security of the information that is to be transferred is of increased concern and these versions/embodiments comprise further steps. In a first additional step the information transfer point transfers a crypto key to the information consumer by means of the secondary bidirectional transfer network before, during or after transferring information over the digital video broadcasting system. The information to be transferred is encoded either by the information provider or by the information transfer point. Decoding of the transferred information is performed by means of the transferred crypto key either in the digital

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video broadcasting receiver of the information consumer or by the information consumer. When a high reliability of the transfer of the information is necessary the method according to the invention further comprises the following

5 additional steps. First transferring checksums or the like, of the information that has or will be transferred via the digital video broadcasting system, via the secondary bidirectional transfer network to the information consumer. Secondly checking the transferred information if

10 it is uncorrupted based on the transferred checksums or the like. Checking is performed in the digital video broadcasting receiver of the information consumer or by the information consumer. Thirdly the digital video broadcasting receiver of the information consumer or the

15 information consumer requesting, via the secondary bidirectional transfer network, to the information transfer point a resending of corrupted transferred information.

By providing a method for transferring information from an information provider to an information consumer over only

20 selected parts of a digital video broadcasting system/network, a plurality of advantages over prior art systems are obtained. By providing information to an information transfer point of which DVB transmitters is and optionally which can be received by the information

25 consumer then the information transfer can be directed accordingly without having to download the whole system. The information needed by the information transfer point is transferred to it by means of a secondary bidirectional transfer network which can be a readily available telephone

30 network such as GSM. A high security is obtained by transferring crypto keys and the like directly to the information consumer by means of the secondary bidirectional transfer network which in that case preferably is a point to point transfer network. High

35 reliability is obtained by using the secondary

bidirectional transfer network as a back channel for requests for resending faulty blocks of data. By combining a cheap, since the whole system bandwidth is not used, high capacity broadcasting system and a lower capacity or more expensive secondary bidirectional transfer network an efficient manner of transferring information is obtained according to the invention. Another advantage of the invention is the ability to be able to identify an information consumer either by the DVB receiver identity, the identity of the secondary bidirectional transfer network transceiver, another identifier which is hardware independant, or an arbitrary combination of the above.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in more detail for explanatory, and in no sense limiting, purposes, with reference to the following figures, in which

- Fig. 1 shows a block diagram of one embodiment of a system according to the invention,
- Fig. 2 shows a flow chart of a method according to the invention,
- Fig. 3 shows a flow chart of another method according to the invention,
- Fig. 4 shows a flow chart of how a high security and error tolerance is accomplished according to one method of the invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

In order to clarify the system according to the invention, some examples of its use will now be described in connection with Figures 1 to 4.

5 Figure 1 shows a block diagram of one embodiment of a system according to the invention. As indicated in the figure and below, certain parts can form smaller or larger groups. The information that is to be transferred to an information consumer / terminal 190 can be found at an information / content provider 100. The other parts that
10 make up the system are an information transfer point / a service provider 110, an access information database 120, a digital video broadcasting (DVB) network / a network provider 140 with associated cells 145, 146, 147, a secondary bidirectional transfer network / an interaction
15 network 130, an information consumer / terminal 190 with a DVB receiver 191 and a transceiver 192 for the secondary bidirectional transfer network 130 and optionally means 199 for handling encrypted transmission. The access
20 information database 120 is used to identify the secondary bidirectional transfer network 130 and access in that network to an information consumer. The invention is not dependent on the exact physical closeness of the different parts, logically the information consumer 190 is preferably
25 apart from the other parts 100, 110, 120, 130, 140 of the system. For example the information transfer point 110 might be part of the information provider 100, or form part with the access information database 120 and the DVB network / system 140, or be a completely independent service. As mentioned there are many possibilities, but
30 they do not affect the invention.

Basically the invention locates the information consumer 190 and directs the information only to the whereabouts of the information consumer 190. The invention utilizes a broadcasting system 140 for transfer of information to the

information consumer 190. A broadcasting system is very effective in transferring information to many receivers. Sometimes a broadcasting system is referred to as a point to multi point transfer system. A customary manner to transfer information to (and from) a single recipient is to use a so called point to point transfer system. A common disadvantage with a point to point system is that it is very expensive per unit of transferred information. A very attractive advantage with using a DVB system for transfer of information is its extremely large bandwidth, i.e. it can transfer large (huge) amounts of data / information in a very short space of time. By locating a receiver / consumer of information 190 in a broadcasting system 145, 146, 147 the transfer of information can be directed to that locality 146, enabling simultaneous use of the network by spatially separated receivers making the transfer of information very cost effective. A DVB system can be of a SFN (Single Frequency Network) nature, be of a more traditional television broadcasting nature with different frequency regions / cells 145, 146, 147 or a combination of both where there can be a SFN covering a nation or large region and also several different DVB frequency regions within the same coverage area, each of which can be a small SFN system. It is possible to direct and send different information within a SFN as well as in the traditional cell structure. Sending different information in a SFN requires great care, but is possible. However, both methods preferably require that the locality of the receiver to be known if transmission of information to a single information consumer 190 is to be efficient. Broadcasting of information in a DVB network is done by means of something called a transport stream that is transmitted at a predetermined carrier frequency from one or more transmitters. A transport stream is a multiplex of information comprising for example elementary streams for one or more programmes (i.e. programme channels such as

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BBC1 or SVT1 and not a time limited show), data, service information, conditional access control, and synchronization information to mention a few. The transport stream was devised for multi-programme applications, i.e. it will usually comprise elementary streams for more than one programme. An elementary stream can, for example, be sound (audio), video, teletext, and data, where, for example, a television broadcast (a programme) comprises several elementary streams such as video, mono audio, stereo audio, teletext etc. The transport stream according to DVB also comprises data structures comprising a multitude of information. The invention makes use of one or more pieces of information within these data structures in dependence on the specific DVB network. Specifically the invention makes use of a combination of one or more of the original network identification (original_network_id), the transport stream identification (transportstream_id), and the network identification (network_id) available in the data structures of a DVB transport stream.

According to the invention a secondary bidirectional transfer network 130 is used to transfer the information of the locality of the information consumer to the information transfer point 110. One method of acquiring the locality itself of the information consumer would be to use a GPS (Global Positioning System) and send the information to the information transfer point 110 via the secondary bidirectional transfer network 130. However, it could be seen as a disadvantage at times to have to include a GPS with the information consumer.

Another method of locating the information consumer 190 would be to use the information that a cell based secondary bidirectional transfer network 130, such as GSM, generates. Unfortunately that information is usually the propriety of

the operator to that network and thus unavailable to users outside of that network. The use of that method would then be specific to a specific secondary bidirectional transfer network 130 which could be considered a disadvantage at times.

According to the invention information contained in the transport stream of a DVB broadcast and possibly the frequency of the transmitter of the received transport stream is used to locate the information consumer 190. A combination of one or more of either the transmitter frequency, the original network identification (original_network_id), the transport stream identification (transportstream_id), and/or the network identification (network_id), all of the transport stream in question, will uniquely identify the transmitter and transport stream received by the receiver. Different DVB networks will provide different types of information in the transport stream and provide a different meaning to original network identification, transport stream identification, and network identification. In some DVB networks it is sufficient with the original network identification which gives the source of the transport stream and this together with the transport stream identification will uniquely identify where and to what transport stream the information that is to be transferred should be added. If there is no possibility to add the information to the currently received transport stream then there might be a need to also make use of the network identification which should give the network from which the transport stream is received and possibly also the received frequency to thus be able to correctly identify the transmitter from which the transport stream is received. If the transmitter is identified then at least a rough location of the information consumer 190 with its DVB receiver 191 and secondary bidirectional transfer network transceiver 192 is possible to identify to enable

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alternative transport streams that the DVB receiver 191 is
able to receive, for example from the identified
transmitter, to be taken into consideration. In other DVB
networks the original network identification might have no
5 meaning but the network identification uniquely identifies
transmitter and frequency. In these DVB networks it is
fully sufficient to make use of the network identification
and only optionally the transport identification. Thus
10 according to the invention, in dependence of the DVB
network in question, at least one of either the transmitter
frequency, the original network identification, the
transport stream identification, and/or the network
identification is acquired and transferred to the
15 information transfer point 110 via the secondary
bidirectional transfer network 130. One is, as described,
enough to at least roughly locate the information consumer
190 with its DVB receiver 191 and secondary bidirectional
transfer network transceiver 192. Optionally more
20 receivable transport streams and their corresponding
transmitter frequency, original network identification,
transport stream identification, and/or network
identification, are transferred and optionally together
with their respective field strengths. This enables the
25 information transfer point 110 to fairly exactly pinpoint
the information consumer 190 and thereby determine the most
efficient manner in which to transfer the information.
Criteria that the information transfer point 110 can use
could for example be the direction of travel, free capacity
30 in the different transport streams, the amount of
information to transfer, what transport streams are
receivable, urgency / priority of the request to transfer
information, and so on.

Figure 2 shows a flow chart of a method according to the
invention utilizing, for example, a system according to
35 figure 1. The method according to figure 2 describes when

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a demand for transferring information to an information consumer arises from an information provider, i.e. a push system. In a first step, a demand step 210, a demand to transfer information to an information consumer originates at an information provider. This demand is transferred as a request to an information transfer point in a request step 220. The information transfer point executes a lookup in a lookup step 230 to establish the known methods of establishing contact with the information consumer. Based on the lookup in an establish contact step 240, contact with the information consumer is established. The step of establishing contact 240 can optionally involve the following substeps. Substep SBTN or DVB ? 241 establishes if the initial contact with the information consumer is to be done via the secondary bidirectional transfer network (SBTN) or via the digital video broadcasting network (DVB). This information is usually available and established in the lookup step 230. If the secondary bidirectional transfer network is to be used then a substep contact ? 242 determines if it is possible to establish contact with the information consumer. If it is possible to establish contact with the information consumer, then in substeps DVB on ? 243 and turn on 244 it is made sure that the DVB receiver of the information consumer is turned on whereafter the procedure continues with step minimum info 250. If no contact was possible to establish in substep contact ? 242 due to, for example, the fact that the secondary bidirectional transfer network transceiver of the information consumer is turned off or the information transfer point has no or erroneous information about the secondary bidirectional transfer network of the information consumer, then one method to continue is to go to substep DVB broadcast 245. In the substep DVB broadcast 245 a general call is made via a part of or the complete DVB network to alert the information consumer that a demand to transfer information has arisen. If the general call is

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received by the information consumer in a substep received broadcast 246 then the information consumer should turn on its secondary bidirectional transfer network transceiver and confirm to the information transfer point in a substep confirm 247 that it has received the call and thereafter continue with step minimum info 250. On the other hand if the information transfer point does not receive a confirmation or any other contact with the information consumer within a predetermined space of time then in a substep timeout 248 the information provider is notified that no contact was possible to reach with the information consumer. After initial contact has been made with the information consumer then in the step minimum info 250 the information consumer transfers to the information transfer point via the secondary bidirectional transfer network transfer configuration information comprising at least one of either the transmitter frequency, the original network identification, transport stream identification, and/or network identification, of the transport stream that the DVB receiver of the information consumer can receive. Optionally in a substep optional info 251 the information consumer also provides the information transfer point with additional transfer configuration information such as additional receivable transport streams and corresponding information, field strengths of received transmitters, optional transfer routes etc. Also optionally in a substep select 252 the information transfer point determines / selects an optimal route / transport stream to send the information. Finally in a transfer step 260 the information is transferred from the information provider to the information consumer via the digital video broadcasting network.

Figure 3 shows a flow chart of another method according to the invention utilizing, for example, a system according to figure 1. The method according to figure 3 describes when

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a demand for transferring information to an information consumer arises from the information consumer, i.e. a pull system. In a first step, a need step 210, a need for a transfer of information to the information consumer originates in the information consumer itself. In the optional substeps DVB on ? 311, turn on 312, SBTN on ? 313, and turn on 314 the information consumer makes sure that the necessary equipment is turned on. Thereafter the information consumer in the step minimum info 320 makes an initial contact with and also transfers to the information transfer point via the secondary bidirectional transfer network the request for information and transfer configuration information comprising at least one of either the transmitter frequency, the original network identification, the transport stream identification, and/or the network identification, of a transport stream that the DVB receiver of the information consumer can receive. Optionally in a substep optional info 321 the information consumer also provides the information transfer point with additional transfer configuration information such as additional transport streams, field strengths of received transmitters, optional transfer routes etc. In a data step 330 the information transfer point retrieves the requested information from an information provider. Optionally in a substep confirmation 331 the information transfer point confirms to the information consumer if the requested information is available or not. Also optionally in a substep select 332 the information transfer point determines / selects an optimal route / transport stream to send the information. Finally in a transfer step 360 the information is transferred from the information provider to the information consumer via the digital video broadcasting network.

Figure 4 shows a flow chart of how high security and error tolerance is accomplished according to one method of the

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invention which can be implemented in the methods according to figures 2 and 3 as substeps to the transfer steps 260 and 360 respectively. In a first step key 461, a crypto key or the like is transferred to the information consumer via the secondary bidirectional transfer network. In a second step transfer 462, encoded information is transferred to the information consumer via DVB. The information is decoded / decrypted and a test is made in a step OK ? 463 to determine if the information was received intact. If it was received without any errors then in a step confirmation 466 the information consumer can optionally confirm, via the secondary bidirectional transfer network, the reception of the information to the information transfer point. To make the transfer as efficient as possible it is probably in most embodiments of the invention suitable not to confirm correctly received information. On the other hand if there is an error in the received information then the information consumer in a step demand resend 464 makes a demand, via the secondary bidirectional transfer network, to the information transfer point to resend the faulty information. The information is resent in a step resend 465 over the DVB network after which the procedure proceeds with step OK ? 363.

The present invention can be put into apparatus-form either as pure hardware, as pure software or as a combination of hardware and software. If the method according to the invention is realised in the form of software, it can be completely independent or it can be one part of a larger program. The software can suitably be located in a general purpose computer or in a dedicated computer.

As a summary, the invention can basically be described as a method which provides an efficient manner of transferring information to an information consumer within a DVB network using a secondary bidirectional transfer network.

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The invention is not limited to the embodiments described above but may be varied within the scope of the appended patent claims.

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CLAIMS

1. A method for transferring information from an
5 information provider to a predetermined information
consumer by means of a digital video broadcasting system to
a digital video broadcasting receiver of the predetermined
information consumer and by means of support of a secondary
10 bidirectional transfer network to thereby enable an
efficient information transfer when a demand to transfer
information to the predetermined information consumer is
originated by the information provider, characterized in
that the method comprises the following steps:
- 15 - the information provider establishing contact with an
information transfer point for requesting transfer of
information to the predetermined information consumer;
 - the information transfer point retrieving access
information of the predetermined information consumer
based on the request from the information provider;
 - 20 - the information transfer point establishing an initial
contact with the predetermined information consumer
based on the retrieved access information about the
predetermined information consumer;
 - 25 - the predetermined information consumer providing the
information transfer point, via the secondary
bidirectional transfer network, with transfer
configuration information comprising at least one of
either a transmitter frequency, an original network
30 identification, a transport stream identification,
and/or a network identification of a transport stream
of a digital video broadcasting transmitter that the
digital video broadcasting receiver of the
predetermined information consumer can receive;

- the information provider via the information transfer point, based on the transfer configuration information, transferring information over the digital video broadcasting system to the digital video broadcasting receiver of the predetermined information consumer to thereby transfer information from the information provider to the predetermined information consumer in an efficient manner.
- 5
2. The method according to claim 1, characterized in that based on the transfer configuration information the information transfer point can transfer the information to the digital video broadcasting receiver of the predetermined information consumer over a selected transmitter or transmitters in the digital video broadcasting system.
- 10
- 15
3. The method according to claim 1 or 2, characterized in that the access information of the predetermined information consumer provides information of how contact can be made with the predetermined information consumer via the secondary bidirectional transfer network and that the step of establishing an initial contact with the predetermined information consumer is done via the secondary bidirectional transfer network based on the access information of the predetermined information consumer.
- 20
- 25
4. The method according to claim 3, characterized in that if the step of establishing initial contact with the predetermined information consumer via the secondary bidirectional transfer network cannot be concluded then a broadcast over the digital video broadcasting system is performed to alert the predetermined information consumer to establish contact with the information transfer point.
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5. The method according to claim 4, characterized in that if the information transfer point after a timeout has not been able to establish contact with the predetermined information consumer then the information provider is notified that the predetermined information consumer cannot be positively contacted.

6. The method according to claim 1 or 2, characterized in that the access information of the predetermined information consumer either provides no information on how contact can be made with the predetermined information consumer via the secondary bidirectional transfer network or the access information provides information of how the predetermined information consumer is to be contacted by means of broadcasting over the digital video broadcasting system to thereby alert the predetermined information consumer to establish contact with the information transfer point and that the step of establishing an initial contact with the predetermined information consumer is done via a broadcast over the digital video broadcasting system to thereby alert the predetermined information consumer to establish contact with the information transfer point.

7. The method according to claim 6, characterized in that if the information transfer point after a timeout has not been able to establish contact with the predetermined information consumer then the information provider is notified that the predetermined information consumer cannot be positively contacted.

8. The method according to any one of claims 1 to 7, characterized in that the transfer configuration information further also comprises at least one of either a transmitter frequency, an original network identification, a transport stream identification, and/or a network identification, of transport streams of

transmitters receivable by the digital video broadcasting receiver of the predetermined information consumer, the field strengths of receivable transmitters, what programme if any the digital video broadcasting transmitter of the
5 predetermined information consumer is currently receiving, or alternative information transfer routes.

9. The method according to any one of claims 1 to 8, characterized in that the information transfer point based on the transfer configuration information determines when and with what transport stream the information transfer is to take place and by means of the secondary bidirectional transfer network notifies the predetermined information consumer of when and with what transport stream the information transfer is to take place.
10

10. The method according to any one of claims 1 to 9, characterized in that the method further comprises the following steps:
15

- the information transfer point transferring a crypto key to the predetermined information consumer by means of the secondary bidirectional transfer network before, during or after transferring information over the digital video broadcasting system;
20
- encoding the information to be transferred either by the information provider or by the information transfer point;
25
- decoding by means of the transferred crypto key the transferred information either in the digital video broadcasting receiver of the predetermined information consumer or by the predetermined information consumer.

11. The method according to any one of claims 1 to 10, characterized in that the method further comprises the following steps:
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- transferring checksums or the like, of the information that has or will be transferred via the digital video broadcasting system, via the secondary bidirectional transfer network to the predetermined information consumer;
5
- checking the transferred information if it is uncorrupted based on the transferred checksums or the like, checking in the digital video broadcasting receiver of the predetermined information consumer or
10 by the predetermined information consumer;
- the digital video broadcasting receiver of the predetermined information consumer or the predetermined information consumer requesting, via the secondary bidirectional transfer network, to the
15 information transfer point a resending of corrupted transferred information.

12. A method for transferring information from an information provider to an information consumer by means of a digital video broadcasting system to a digital video
20 broadcasting receiver of the information consumer and by means of support of a secondary bidirectional transfer network to thereby enable an efficient information transfer when a demand to transfer information to the information consumer is originated by the information consumer,
25 characterized in that the method comprises the following steps:

- the information consumer establishing an initial contact with an information transfer point via the secondary bidirectional transfer network with a
30 request for an information transfer from the information provider to the information consumer;
- the information consumer providing the information transfer point, via the secondary bidirectional transfer network, with transfer configuration
35 information comprising at least one of either a

transmitter frequency, an original network identification, a transport stream identification, and/or a network identification of a transport stream of a digital video broadcasting transmitter that the digital video broadcasting receiver of the information consumer can receive;

5

- the information transfer point retrieving the requested information;

- the information provider via the information transfer point, based on the transfer configuration information, transferring information over the digital video broadcasting system to the digital video broadcasting receiver of the information consumer to thereby transfer information from the information provider to the information consumer in an efficient way.

10

15

13. The method according to claim 12, characterized in that based on the transfer configuration information the information transfer point can transfer the information to the digital video broadcasting receiver of the information consumer over a selected transmitter or transmitters in the digital video broadcasting system.

20

14. The method according to any one of claims 12 or 13, characterized in that the transfer configuration information further also comprises at least one of either a transmitter frequency, an original network identification, a transport stream identification, and/or a network identification, of transport streams of transmitters receivable by the digital video broadcasting receiver of the predetermined information consumer, the field strengths of receivable transmitters, what programme if any the digital video broadcasting transmitter of the predetermined information consumer is currently receiving, or alternative information transfer routes.

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15. The method according to any one of claims 12 to 14, characterized in that the information transfer point based on the transfer configuration information determines when and with what transport stream the information transfer is to take place and by means of the secondary bidirectional transfer network notifies the information consumer of when and with what transport stream the information transfer is to take place.
16. The method according to any one of claims 12 to 15, characterized in that the information transfer point confirms the availability or non-availability of the requested information to the information consumer via the secondary bidirectional transfer network or via the digital video broadcasting system.
17. The method according to any one of claims 12 to 16, characterized in that the method further comprises the following steps:
- the information transfer point transferring a crypto key to the information consumer by means of the secondary bidirectional transfer network before, during or after transferring information over the digital video broadcasting system;
 - encoding the information to be transferred either by the information provider or by the information transfer point;
 - decoding by means of the transferred crypto key the transferred information either in the digital video broadcasting receiver of the information consumer or by the information consumer.
18. The method according to any one of claims 12 to 17, characterized in that the method further comprises the following steps:

- transferring checksums or the like, of the information that has or will be transferred via the digital video broadcasting system, via the secondary bidirectional transfer network to the information consumer;
- 5 - checking the transferred information if it is uncorrupted, based on the transferred checksums or the like, checking in the digital video broadcasting receiver of the information consumer or by the information consumer;
- 10 - the digital video broadcasting receiver of the information consumer or the information consumer requesting, via the secondary bidirectional transfer network, to the information transfer point a resending of corrupted transferred information.

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108749.SE SPB

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TITLE:

Method for transferring information

5 ABSTRACT:

10 The above-mentioned objects are achieved in accordance with
the invention by a method for transferring information from
an information provider (100) to an information consumer
(190) in a highly efficient manner by means of a digital
video broadcasting (DVB, 140) system and a secondary
bidirectional transfer network (130). The secondary
bidirectional transfer network provides information of
where the DVB receiver (191) of the information consumer is
located so that only suitable DVB transmitters (146) in the
15 area are used for the information transfer itself. The
location is determined by having at least one of either the
transmitter frequency, the original network identification,
the transport stream identification, and/or the network
identification, of a transport stream of one transmitter
20 that the receiver can receive transferred via the secondary
bidirectional transfer network. Thereby only the necessary
DVB transmitters need to be used for the information
transfer, thus relieving the rest of the DVB transmitters
(145, 147) from an unnecessary downloading.

25 (Fig. 1)

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FIG 1

100 requester / information provider
 110 information transfer point
 5 120 database
 130 secondary bidirectional transfer network SBTN
 140 DVB - Network provider
 145 cell 1
 146 cell 2
 10 147 cell 3
 190 user
 191 DVB receiver
 192 SBTN transceiver
 199 crypto

15 FIG 2

210 demand - for transfer of info to info consumer IC
 220 request - to information transfer point ITP
 230 lookup - of secondary bidir transfer network SBTN
 240 establish contact - with info IC based on lookup
 20 241 SBTN or DVB ? - no SBTN given then DVB broadcast
 242 contact ? - with / via SBTN
 243 DVB on ?
 244 turn on - if not
 245 DVB broadcast
 25 246 received broadcast ?
 247 confirm - if received
 248 timeout - and notify demander
 250 minimum info -
 251 optional info - field strength,
 30 252 select - method / DVB channel of transfer
 260 transfer - info to information consumer

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FIG 3

310 need - of the information consumer
311 DVB on ?
312 turn on - if not
5 313 SBTN on ?
314 turn on - if not
320 minimum info -
321 optional info - field strength, what program
330 data - is retrieved int. or ext. to ITP
10 331 confirmation - to IC that data is available
332 select - method / DVB channel of transfer ...
360 transfer - info to IC

FIG 4

461 key - to crypto sent via SBTN to DVB / IC
15 462 transfer - encoded blocks via DVB
463 OK ?
464 demand resend - of blocks that were not OK
465 resend - blocks
466 confirmation - to ITP that all OK

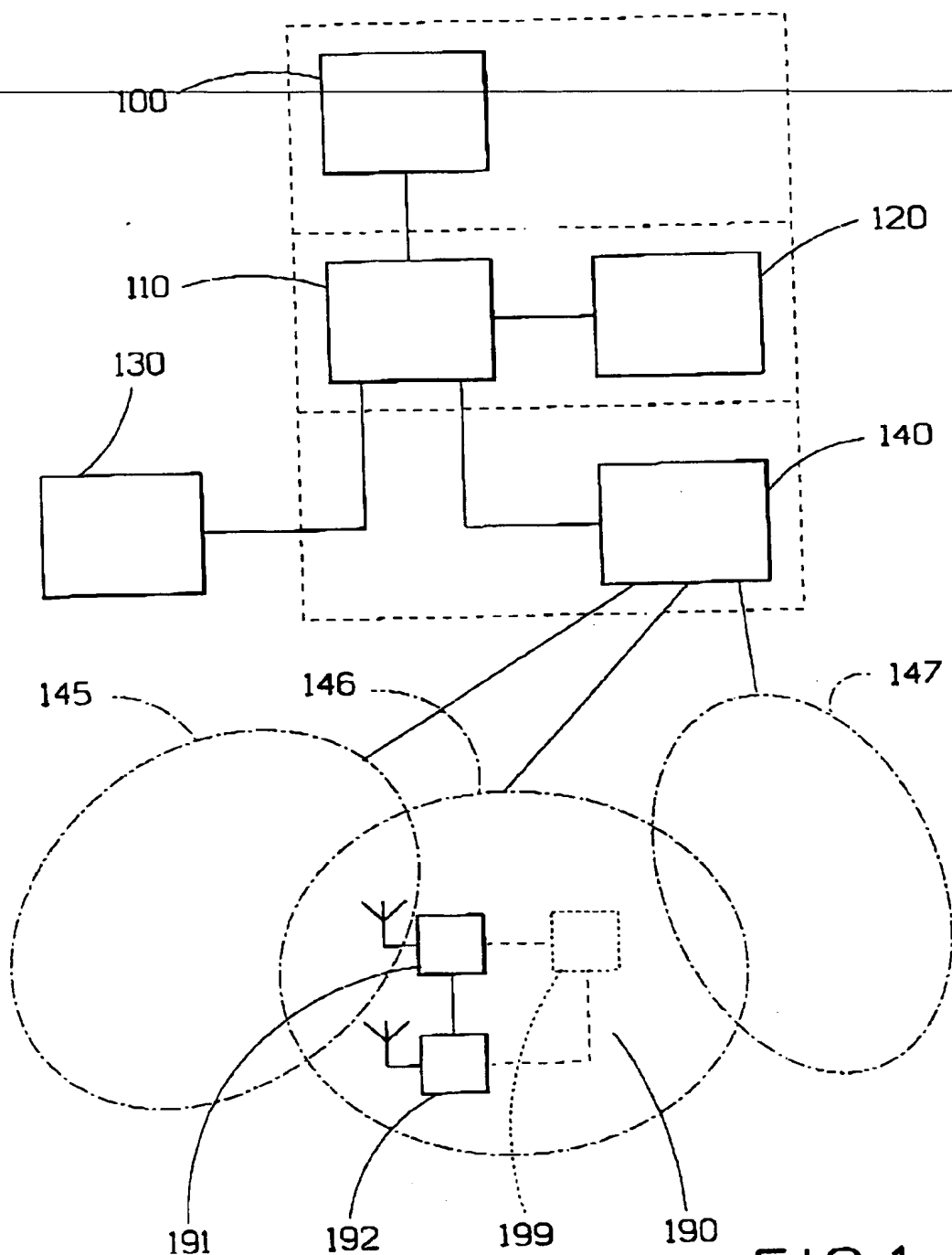


FIG.1

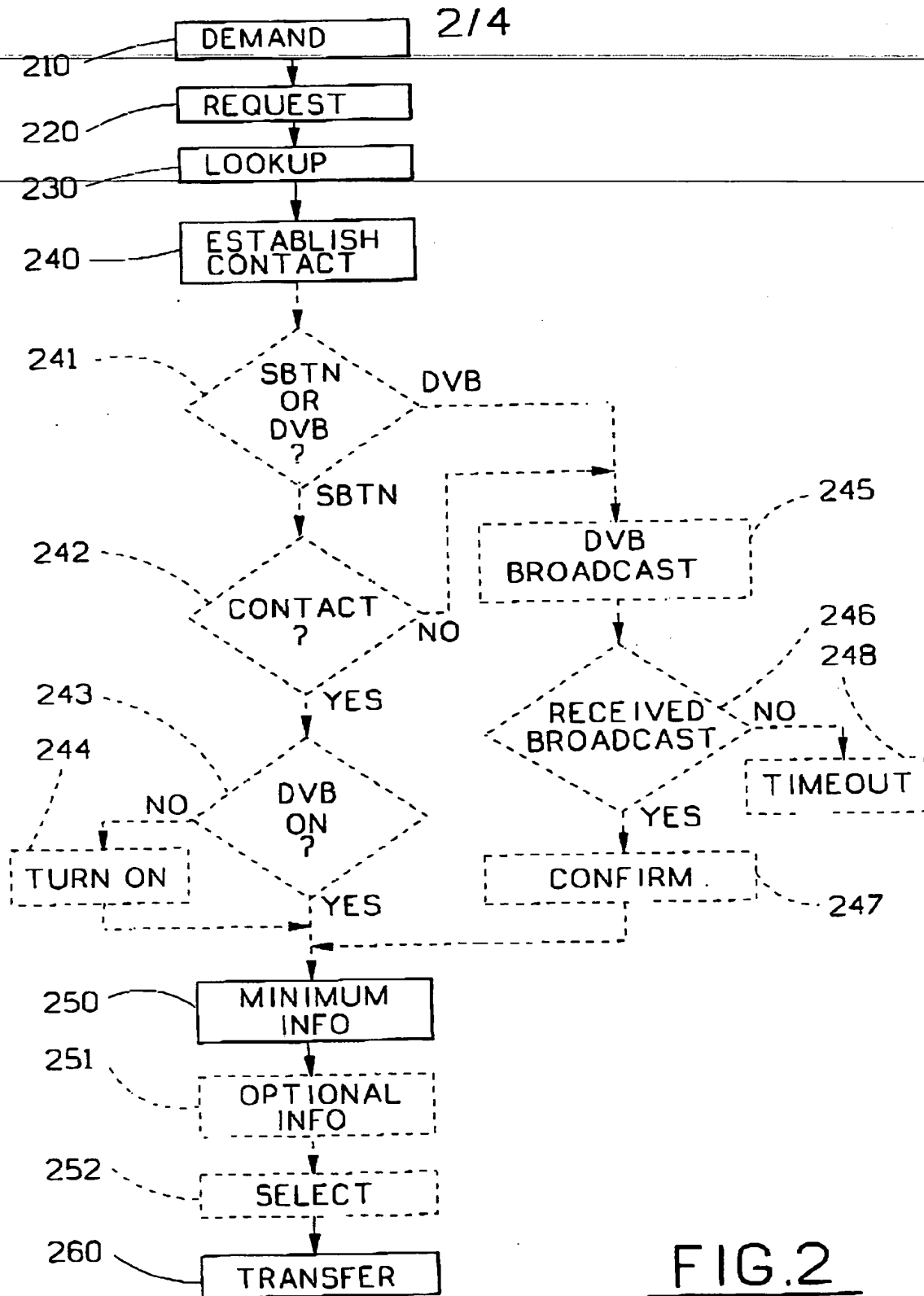


FIG.2

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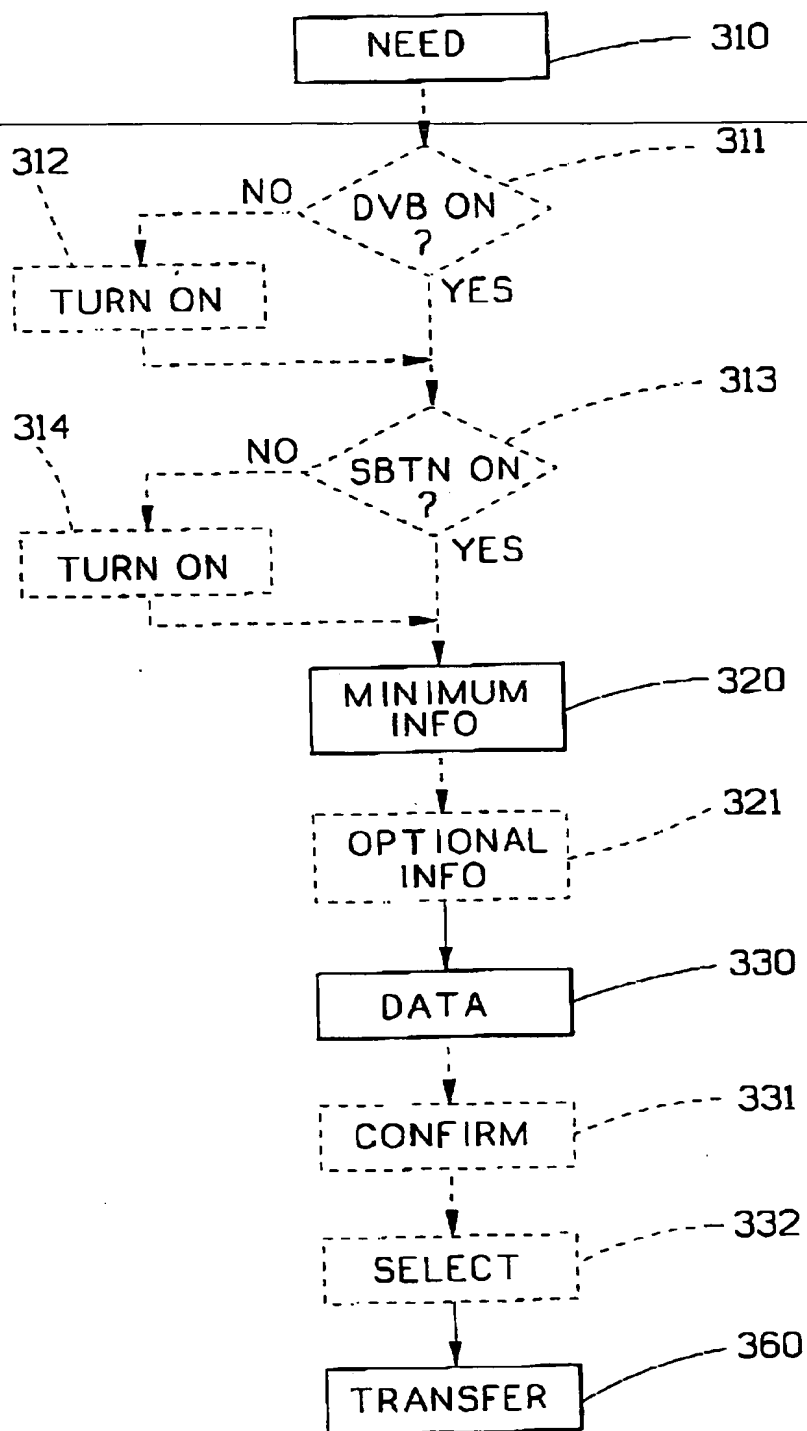


FIG.3

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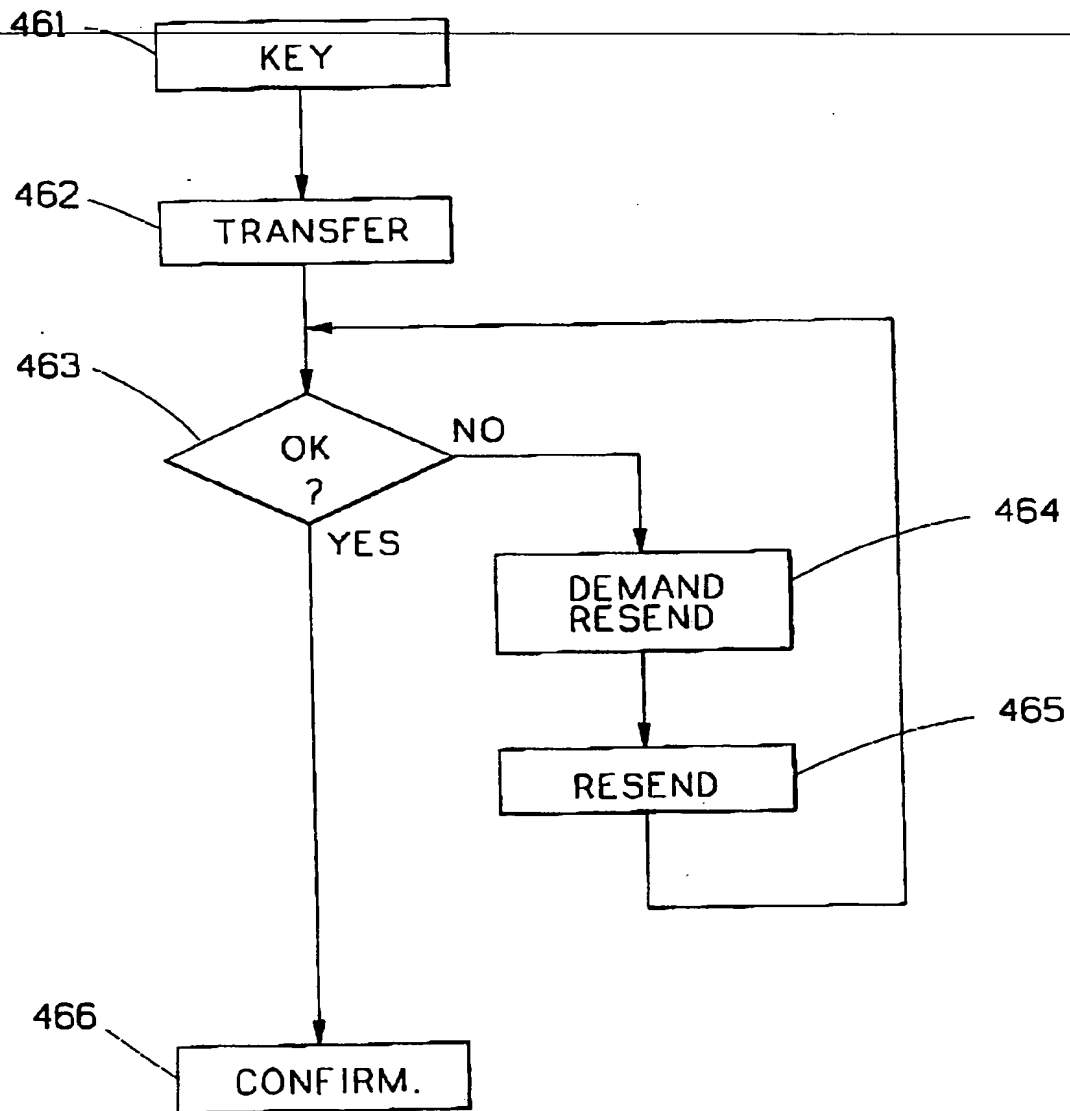


FIG.4